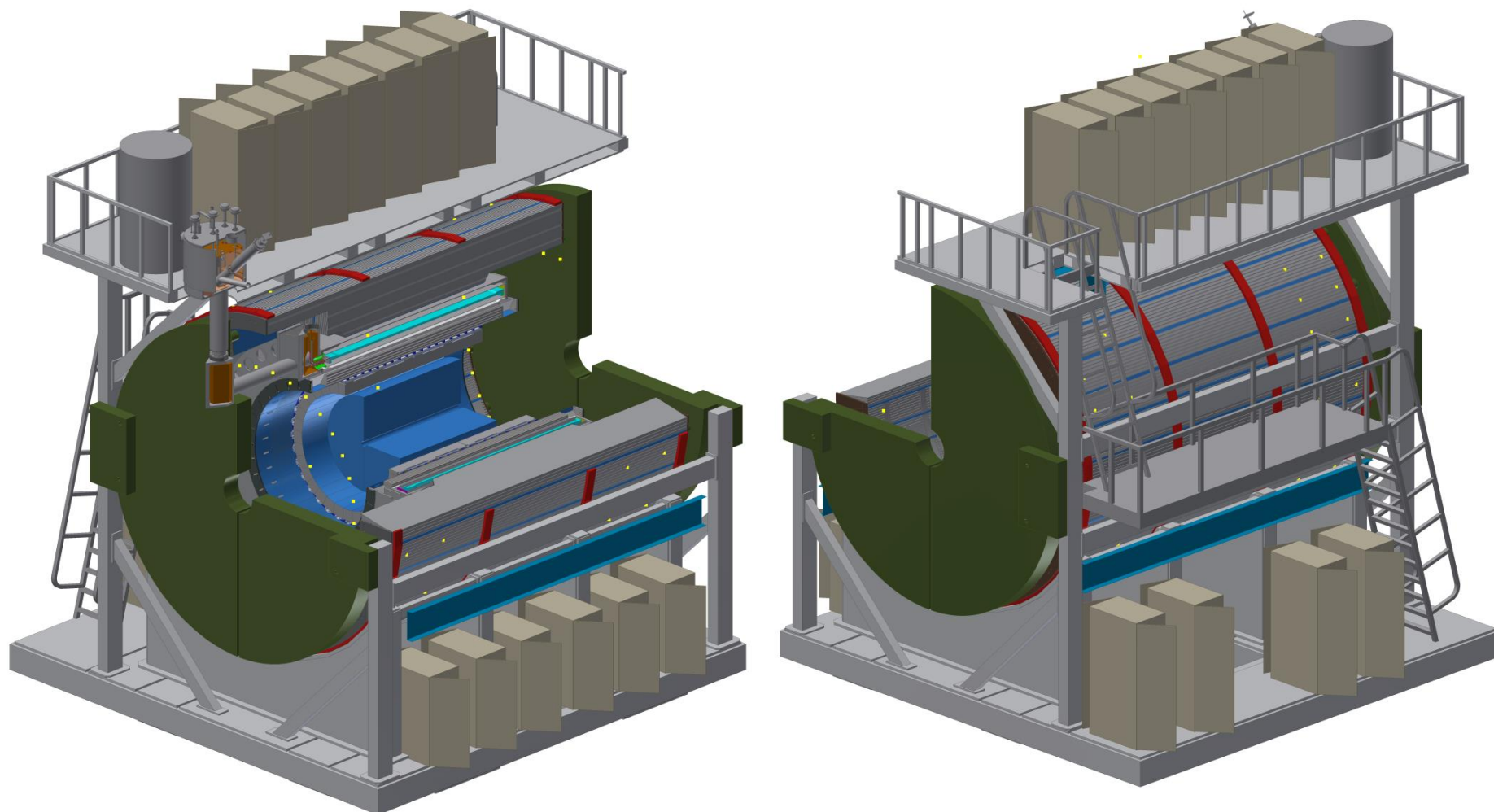


# INTEGRATION



# INTEGRATION REQUIREMENTS

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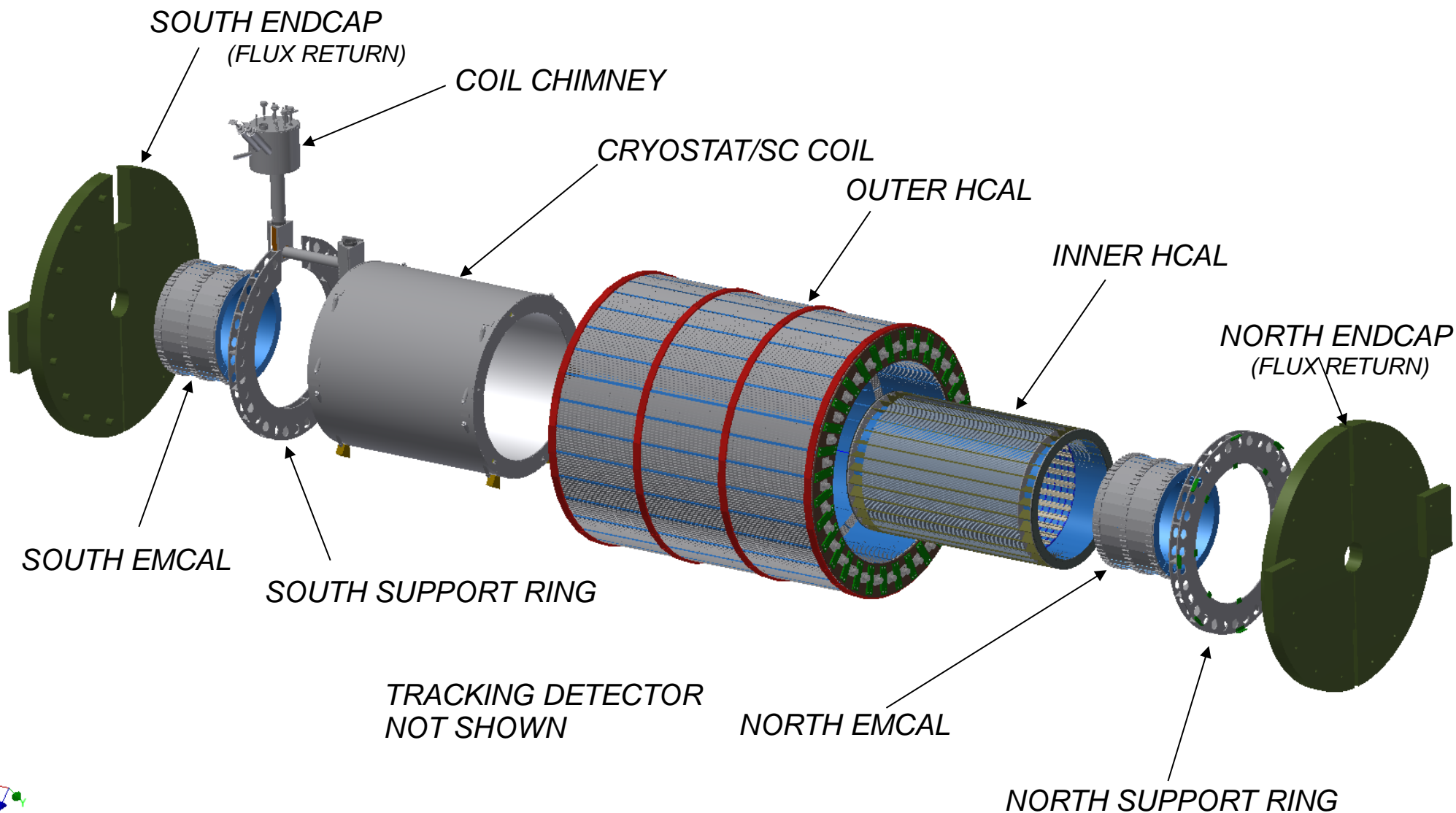
- Define overall envelope for sPhenix. (DWG# SP00-000-000).
  - Includes relevant existing infrastructure.
    - Tracks, IR walls, MuID, Crane hooks etc.
  - Envelope to include nuts bolts cables.
  - Only collaboration can change detector envelopes.
  - Stay clear regions between detectors for clearance & installation.
  - Ensure everything fits.
  - Define detector attachment points.
- Cable Management & Routing.
  - HV, LV, Signal & Cooling requirements
  - Provided to Integration by subsystem for inclusion in overall envelope.

# INTEGRATION DESIGN DRIVERS

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- Subsystem Design
  - Existing Infrastructure (shield wall opening, Crane coverage and limits, rail layout)
  - Minimum material in active areas
  - Access for repair, maintenance, upgrade
  - Safety
- 
- (Future upgrade capability)

# SPHENIX EXPLODED VIEW



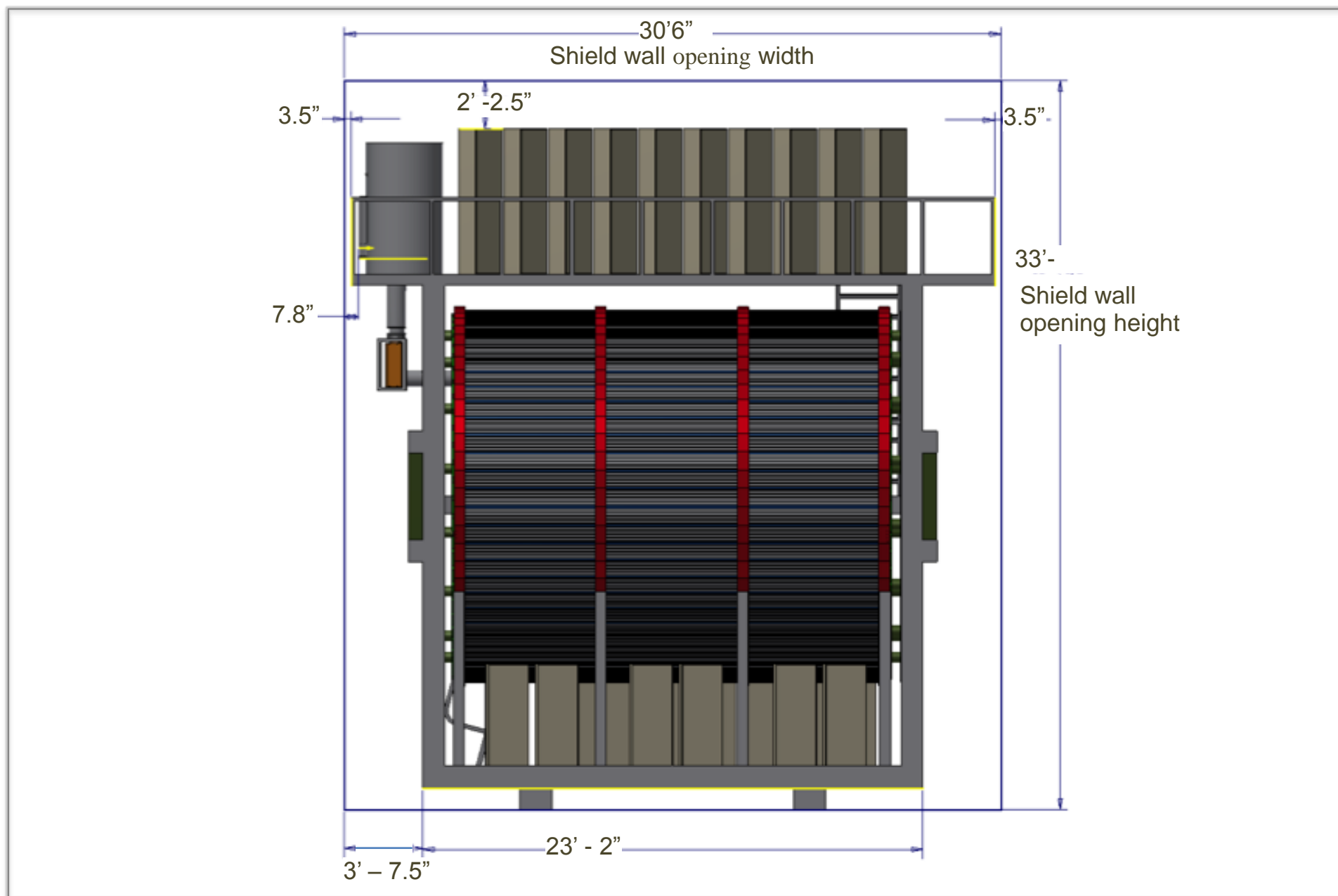
1. NOTED DIMENSIONS ARE MAXIMUM SIZE.  
ALL SERVICES, NUTS, BOLTS & OTHER DETECTOR  
COMPONENTS SHALL NOT EXCEED THESE DIMENSIONS.

2. **ALL DIMENSIONS ARE IN mm[inch].**

- AUTOCAD DRAWING
- SHOWS RELEVANT EXISTING INFRASTRUCTURE
- ONGOING EFFORT FOR SPHENIX

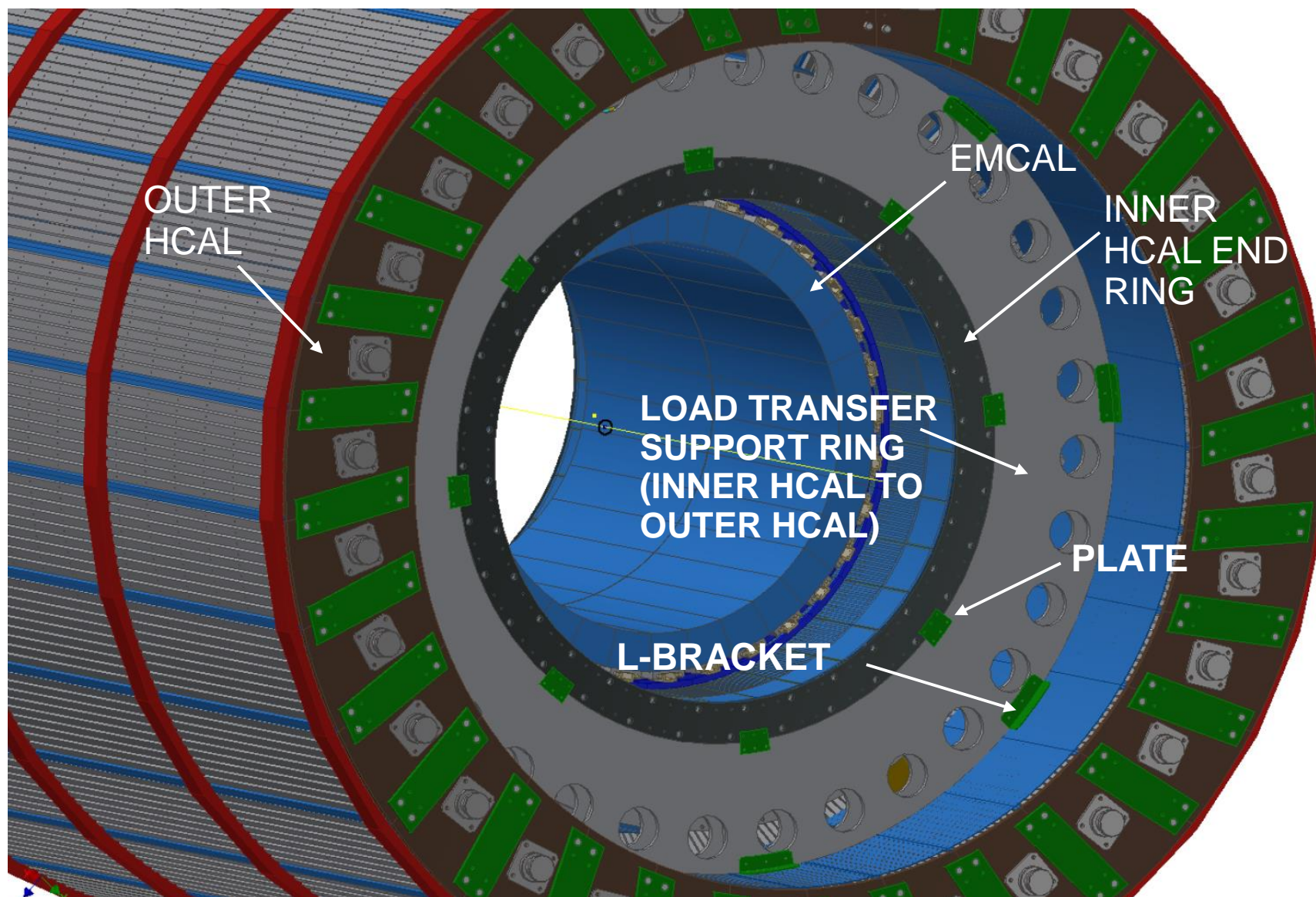


# sPHENIX Overall Size and Shield Wall Opening





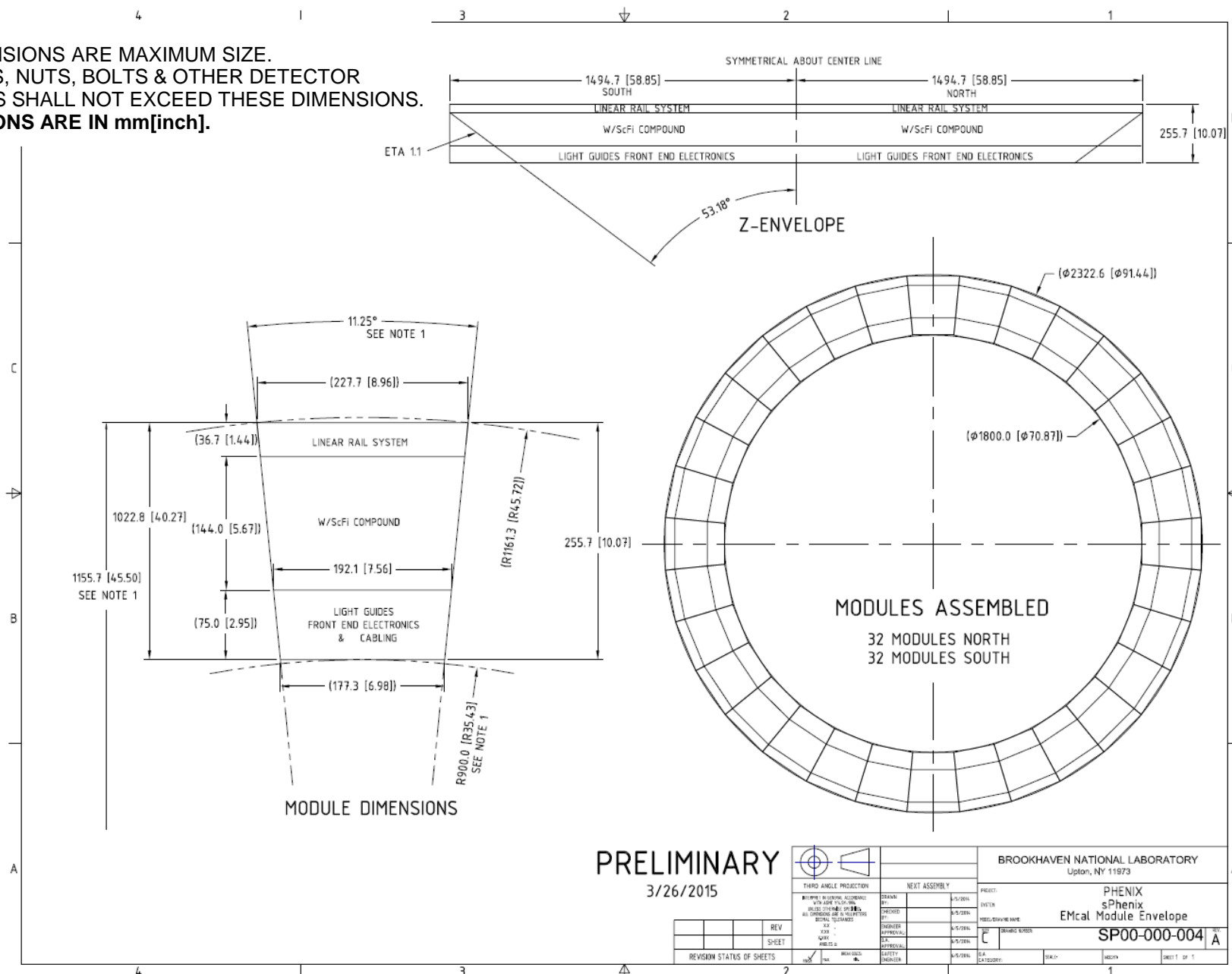
# INNER HCAL ATTACHMENT POINTS



# EMCAL ENVELOPE DRAWING

## NOTES:

1. NOTED DIMENSIONS ARE MAXIMUM SIZE.  
ALL SERVICES, NUTS, BOLTS & OTHER DETECTOR COMPONENTS SHALL NOT EXCEED THESE DIMENSIONS.
2. ALL DIMENSIONS ARE IN mm[inch].

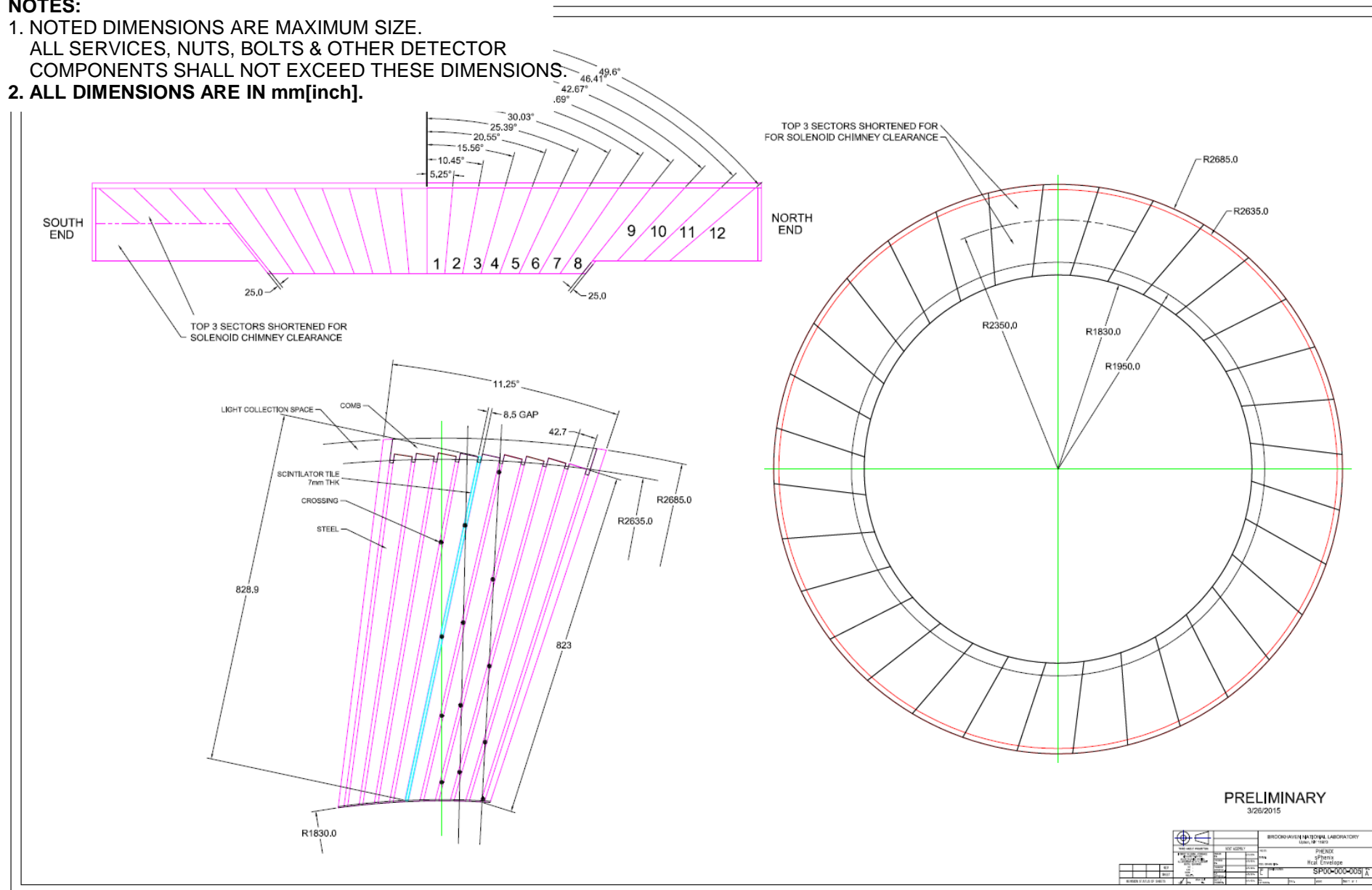




# OUTER HCAL ENVELOPE

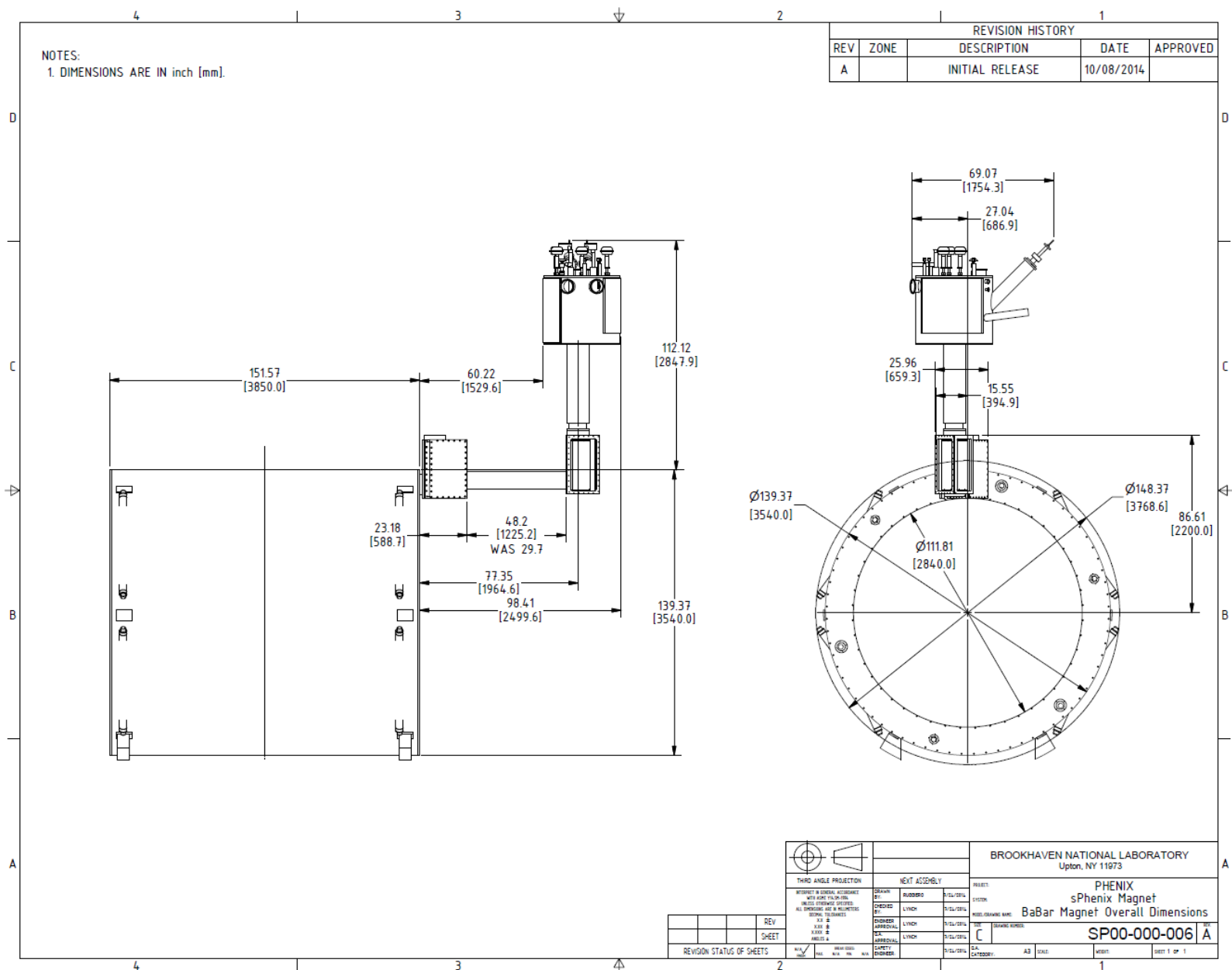
## NOTES:

1. NOTED DIMENSIONS ARE MAXIMUM SIZE.  
ALL SERVICES, NUTS, BOLTS & OTHER DETECTOR COMPONENTS SHALL NOT EXCEED THESE DIMENSIONS.
2. ALL DIMENSIONS ARE IN mm[inch].

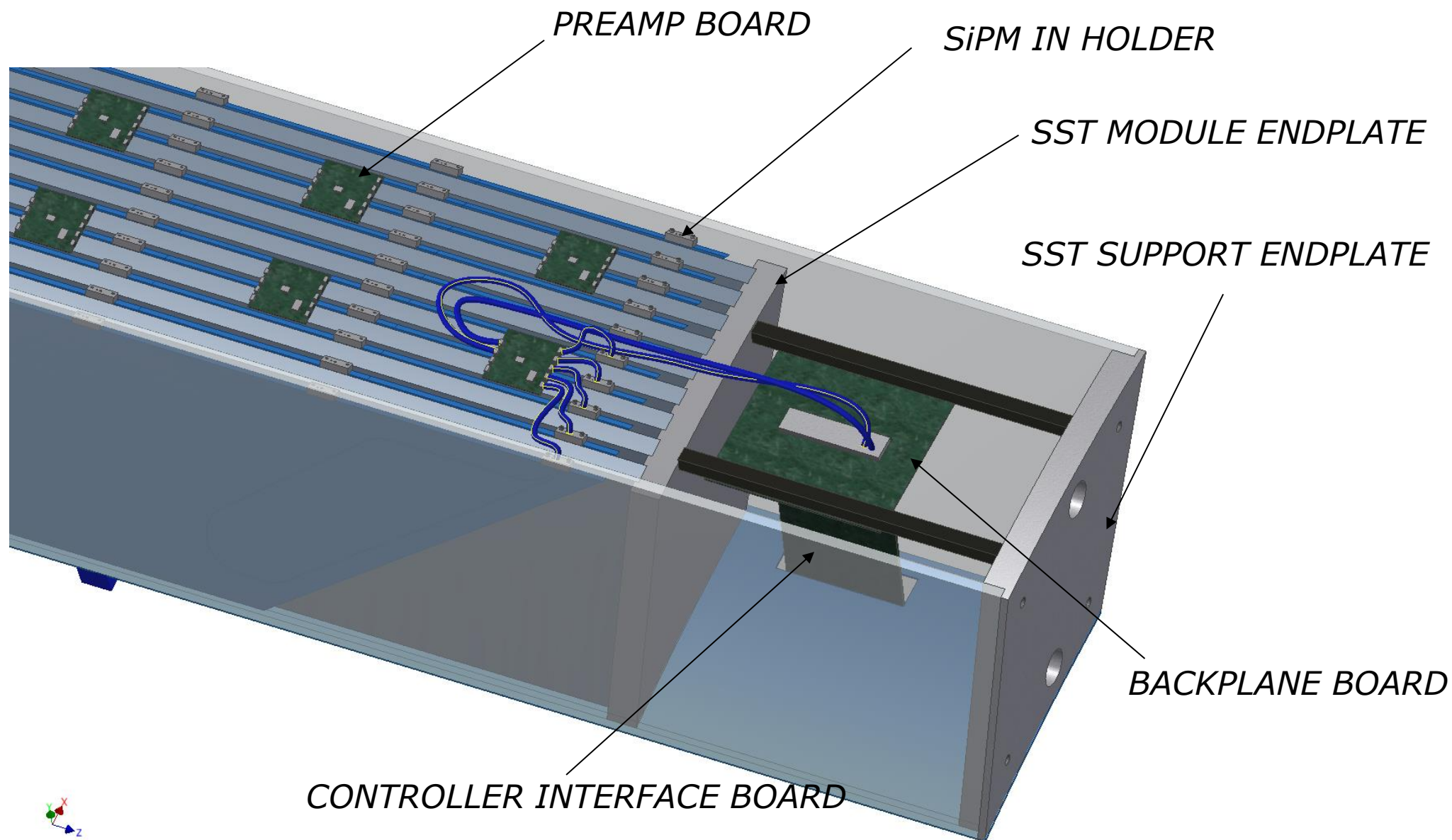




# MAGNET ENVELOPE DRAWING

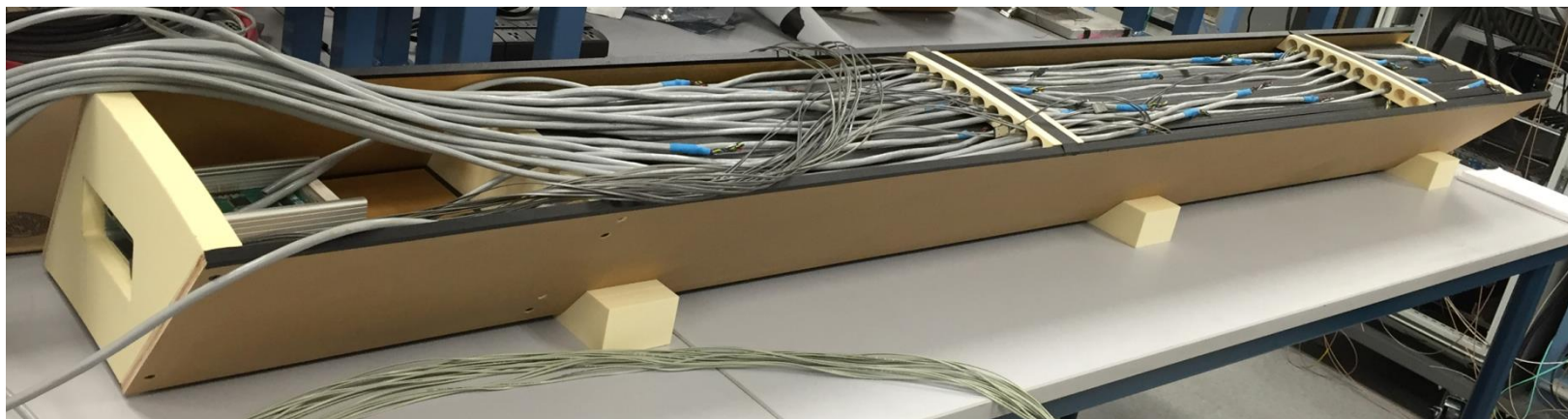


# INNER HCAL ELECTRONICS & CABLE ROUTING



# ALLOCATING SPACE FOR SERVICES

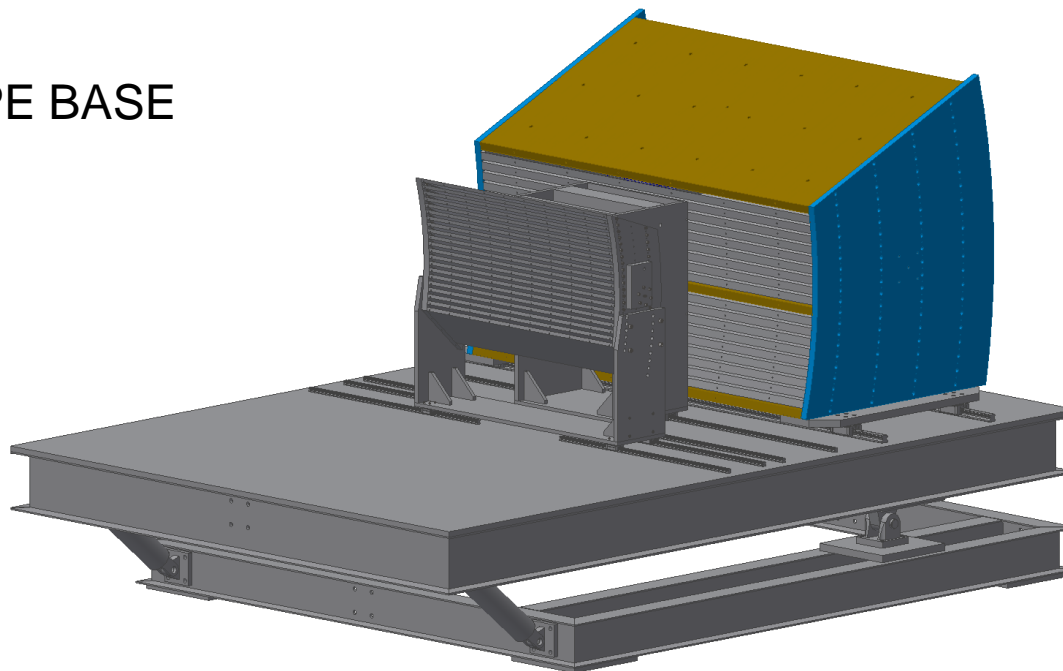
Inner HCal  $\frac{1}{2}$  sector Class II mockup  
(dimensionally accurate/non-functional)





# PROTOTYPES

PERFORMANCE PROTOTYPE BASE  
READY TO MANUFACTURE



STEEL ABSORBER PLATES AND ENDPLATES  
DELIVERED, READY FOR ASSEMBLY



# Technical Status

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- Central Pedestal Conceptual design evolving
  - Detailed design pending final detector designs
- Magnet is received and under acceptance and performance tests
- HCal Inner and Outer Design requirements are defined pending R&D
  - Currently building 2<sup>nd</sup> performance prototype
  - Inner HCal Services mockup built and iterating service routing
  - Engineering mockup planned
- EMCal mechanical design is evolving
  - Mounting scheme under evaluation
  - Sector mechanical design in progress
  - 2<sup>nd</sup> performance prototype in progress
  - Services and engineering mockups in planning stage
- Tracker conceptual design is evolving
- Infrastructure/Services – requirements being defined

# ISSUES AND CONCERNS

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- CABLE ROUTING
- SUBSYSTEM CAD PROGRAM INTEGRATION
- PROJECT DOCUMENT DATABASE
- ALIGNMENT TOLERANCES FOR INDIVIDUAL DETECTOR SUBSYSTEMS
- TRACKER INTEGRATION DESIGN DETAILS
  - WHAT ARE ALIGNMENT REQUIREMENTS?,
  - INSTALL BEFORE OR AFTER BEAMPIPE?,
  - INSTALL AS A UNIT OR IN SECTIONS?